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Faceted gemstone.

The present invention relates to a gemstone having a surface at least part of which is polished, according to the preamble of the first claim.

The technique of polishing gemstones, for example diamonds, by cutting the surface of the diamond is well known in the art. In the known cutting techniques, the surface of the diamond is cut to show a specific number of facets, the facets having determined shapes and sizes and extending under well defined angles with respect to each other. In the known cutting techniques, the diamond is cut to show along the top of the stone a crown with a table, a girdle surrounding the crown, and below the girdle a plurality of pavilion facets which point to the culit. The internal brilliance of the stone, the dispersion of the light by the stone and the amount of light reflected by the stone determine the quality of the cut and of the stone. These parameters are in turn determined by the dimensions of the facets present in the afore mentioned parts of the stone, the angle between adjacent facets and the purity of the stone, as they determine the amount of light entering the table and crown, the dispersion of the light by the girdle, and the amount of light which is reflected by the pavilion facets back towards the crown as non-dispersed light. An example of a specifically cut diamond is for example disclosed in US-A-5.970.744.

A major advantage of the above described generally known cutting technique is that the majority of the stone needs to be cut away in order to achieve the desired symmetry of the stone which induces the brilliance. With a brilliant cut for example the amount of material retained seldom exceeds 50 %. Also, with the known cutting techniques, it is a pre-requisite that the interior of the stone shows perfect cristallinity and that the number of crystal defects, inclusions of foreign material, cracks or

any other defects is as few as possible if an optimum stone quality is aimed at. The reason is that in order to have a brilliance which is as high as possible, the known cutting techniques are developed to render the stone transparent to light. As a consequence of this transparency any defaults present in the interior of the stone are revealed and become visible through the stone. This is unwanted.

The present invention aims at providing a gemstone with which the loss of material in the course of polishing may be minimised, the attractiveness of the stone being virtually independent on the presence or absence of imperfections in the stone.

This is achieved according to the present invention with a gemstone showing the technical features of the characterising part of the first claim.

The gemstone of the present invention is characterised by the presence of a plurality of facets. Thereby the dimensions of the facets are chosen such that the stone comprises a number of adjacent facets which amounts to between 4 and 25 facets per mm^2 of surface area. In practise this means that each facet covers a surface area of between 0.25 and 0.04 mm^2, which is extremely small.

Because the facets applied to the surface of the gemstone have such a small surface area, the facets follow the contours of the stone and loss of material in the course of polishing may be reduced to a minimum.

The inventor has now found that with a stone showing a large number of such adjacent small facets, not only the natural colour of the stone is revealed and gets emphasized, but also that the stone shows a high degree of brilliance the surface and that visibility of impurities, inclusions or cracks or any other defects present in the interior of the stone, may be largely reduced.

The inventor has explained these effects by the observation that the surface of the stone of this invention resembles the

surface of a honeycomb structure. Light impinging the surface of two adjacent facets is reflected in different directions. As the light is reflected by a large number of facets, and as adjacent facets extend under an angle with respect to each other, the light is reflected in a vast number of widely varying directions. Besides this, the light has been found to reflect not only from the planes of the facets but also at the edges, as a consequence of which the gemstone shows a sparkling effect in the light. This reflection by a large number of small facets in a large number of different directions has the effect that the stone shows brilliance even if it is opaque and the light is exclusively reflected by the facets on the outer surface of the stone, and not dispersed or refracted back by the internal part of the stone which is usually the case with for example brilliant cuts. This is surprising.

The inventor has also found that by applying this faceting, the original colour of the stone is revealed and emphasized in an aesthetically attractive manner. This effect is achieved independently of the purity of the stone or the presence of inclusions of foreign material, cracks, etc.

The observation that the visibility of impurities or imperfections, e.g. cracks, present in the stone may be down toned, has increased the economical value of the stone. The inventor has attributed this effect to the fact that the reflection of the light in a large number of different directions, as a consequence of which the visibility of any imperfections is reduced.

A preferred embodiment of this invention is characterised in that the surface of the stone comprises 4-15, more preferably 10-12 facets per mm^2 of surface area. The inventor has found that within this range an optimum reflection of light by the faceted surface may be achieved.

Another preferred embodiment of the gemstone of this invention is characterised by adjacent facets which extend with respect to each other under an angle, the angle between adjacent facets

being between 0.1-5°, preferably between 0.25-1°. In a thus polished stone, the facets follow the contours of the stone. Thus, the loss of material and the risk to cracking or breaking of the stone upon polishing may be minimised. This is important from an economical point of view, as the weight of the stone is one of the parameters determining its value. The inventor has found that with such positioning of the facets, a faceted rock may be obtained the surface of which produces an optimum reflection of the light impinging it in a large number of widely varying directions, thus inducing brilliance to the stone. When the angle between adjacent facets amounts to above 10°, a cut stone is obtained, the facets of which do no longer follow the original contours of the stone, the loss of material becoming undesirably high.

The invention is further elucidated in the appending figure and description of the figure.

Figure 1 is a view to the surface of a preferred embodiment of the gemstone of this invention.

As can be seen from figure 1, the gemstone 1 of this invention comprises a surface area 2, showing a multiplicity of adjacent facets 3, 4, 5. Depending on the intended use of the stone, either the whole surface area 2 may be faceted or only part of it. The latter may for example be of interest, in case only part of the stone will be visible during use. In such case it may be of economical interest to facet only the part of the surface of the stone which will be visible, or a somewhat larger part. The inventor has found that even in case only part of the surface of the stone is faceted, on the faceted part the natural colour of the stone is revealed and emphasised. The partly faceting having virtually no adverse effect to the colour of the stone.

In the gemstone of this invention the facets 3-5, may have any shape ought suitable by the person skilled in the art of reflecting light impinging the surface of the stone. In particular, the facets may have a geometrical shape which may be regular or irregular. Often, an

irregular shape will be preferred as this has the result that a wider diversification may be obtained, of the direction in which the light incidenting the surface of the stone, is reflected. The surface 2 of the stone may exclusively comprise facets having a regular shape, or an irregular shape, or a combination of both. For example, the surface of the stone may comprise facets having a substantially regular 6-edge shaped figure, facets 3,4 having a substantially irregular 5- and 3-edge shaped figure and square facets 5.

As can be seen from figure 1, the surface of the stone may be composed of facets having the same or varying dimensions. In general the dimensions of the facets will be adjusted such that 4-25, preferably 4-15, more preferably 10-12 facets per mm^2 of surface area are present. In practise this means that such facets will have a surface area of between 0.25 – 0.04, preferably 0.25 – 0.083 mm^2, more preferably 0.10 – 0.083 mm^2, as in this range an optimum brilliance of the stone may be achieved combined with an optimum emphasis of the natural colour of the stone and an optimum down toning of any defects, impurities and inclusions present in the stone, combined with a minimum loss of material and minimum risk to breaking of the stone upon polishing. The inventor has observed that light impinging the surface of such a gemstone is immediately reflected, light absorption being largely reduced as compared to stones comprising facets having a larger surface area. With increasing surface area the risk to absorption, and the appearance of large white-like surfaces has been found to occur, which reduce the brilliance of the stone.

The inventor has further found that that when the surface area of a facet increases to above 0.25 mm^2, too much light is reflected in one single direction, as a consequence of which that facet resembles a large white surface, which goes at the expense of the brilliance of the stone. Also, when the faceting of this invention is applied to ornamental diamonds for example, with increasing size of the facets there is an increasing risk to penetration of the light into the interior of the stone,

which goes at the expense of the amount of light reflected by the surface of the stone. A surface area of 0.04 mm^2 per facet appeared to be the smallest possible surface area achievable with existing cutting techniques.

The gemstone suitable for use with the present invention may be any gemstone known to the person skilled in the art, and may for example comprise precious stones for example rough, unpolished diamond, polished diamond, industrial or ornamental diamond, diamond the surface of which shows cracks or holes, polished diamond. This means in fact that the faceting of the present invention may as well be applied to ornamental diamonds showing a specific cut, for example a baguette, taper, emeraude, hart, pear, round, square, marquise, oval, princess, rose, briolette, marigold, or any other cut known to the person skilled in the art. The result is that the brilliance of a thus cut precious stone is further emphasised and that a sparkling effect is induced when light is impinging the stone.

The gemstone suitable for use with this invention may also be a semi-precious stone, for example rubin, smaragd, sapphire, granate etc.

To produce the gemstone of the present invention, use can be made of the conventional cutting or faceting techniques. When producing the gemstone of this invention, a first facet is be polished. A second facet adjacent the first facet is polished. This will mostly involve that an edge of the first facet gets removed, thus making the shape of the first facet asymmetric. When adding additional facets along the surface of the stone, each time an edge of the already existing facets will be removed, as a consequence of which an asymmetric shape is implied to the existing facets. The inventor has found that this effect contributes to the brilliance and sparkling of the stone in the light.